



**OPERATING
SUMMARY**

BURLINGTON

(Drury Lane)

water pollution control plant

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1970
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ONTARIO WATER
RESOURCES COMMISSION

ONTARIO WATER RESOURCES COMMISSION

Division of Plant Operations

TD
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.A56
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1970

Burlington Drury Lane : water
pollution control plant.

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Water management in Ontario

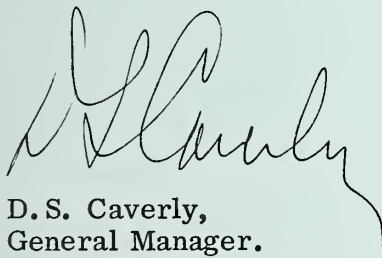
Ontario
Water Resources
Commission

135 St. Clair Ave. W.
Toronto 195
Ontario


Once again we have the privilege of submitting to you our latest detailed report on financial progress and technical activity at your water pollution control plant.

The statistical information contained in this annual operating summary will undoubtedly be a useful barometer of efficiency. Of particular interest will be the comments and recommendations of the regional operations engineer, who was intimately connected with day-to-day operation throughout 1970.

Together with the extensive cost data provided, this information should assist greatly in your general understanding of the problems met and dealt with, and in furnishing a yardstick for possible future expansion.



D. S. Caverly,
General Manager.



D. A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

TD

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BURLINGTON DRURY LANE
water pollution control plant

operated for

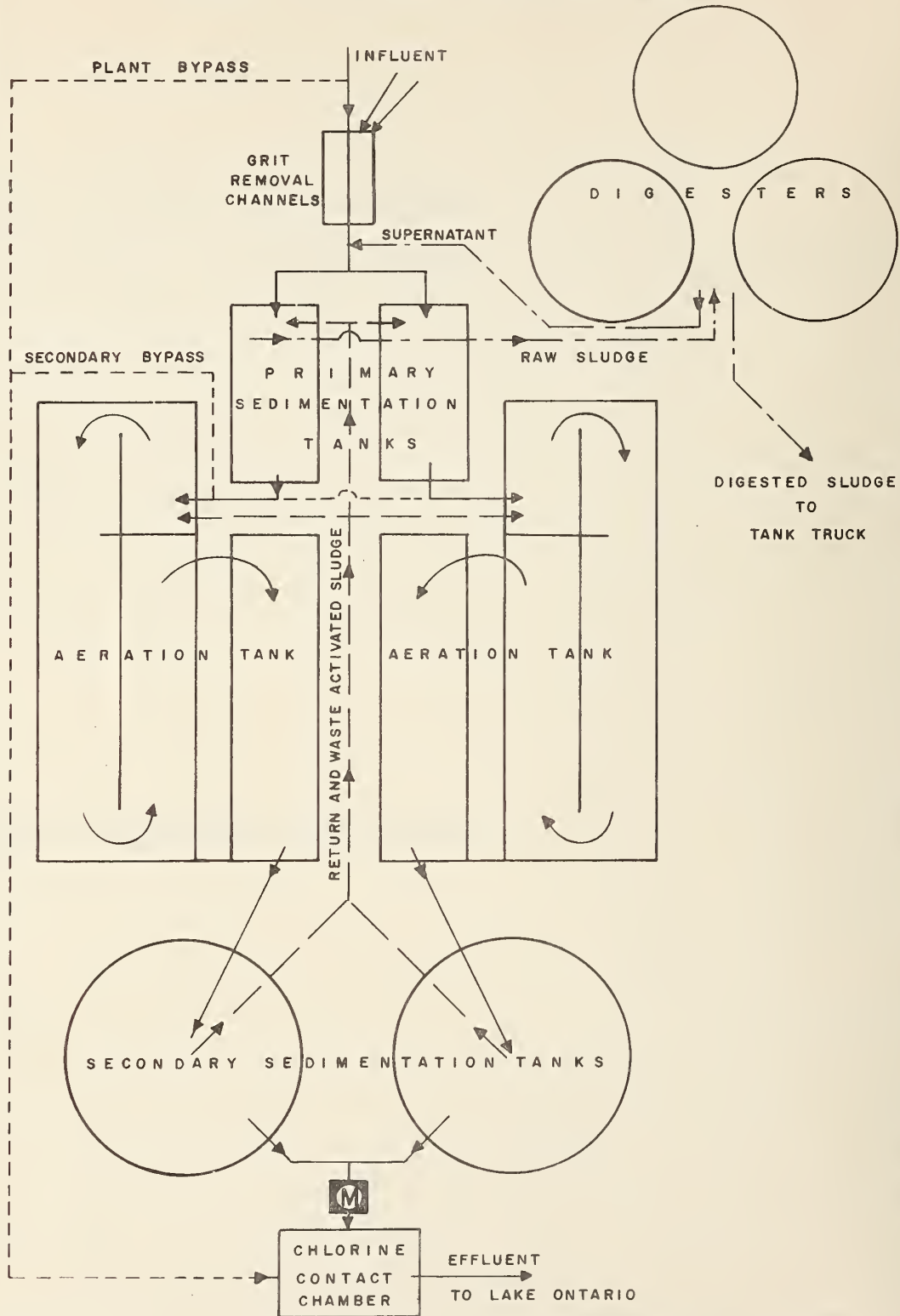
THE TOWN OF BURLINGTON

by the

ONTARIO WATER RESOURCES COMMISSION

1970 ANNUAL OPERATING SUMMARY

BURLINGTON DRURY LANE WATER POLLUTION CONTROL PLANT



DESIGN DATA

PROJECT NO.	2-0051-60	TREATMENT	Activated Sludge
DESIGN FLOW	2.5 mgd	DESIGN POPULATION	30,000
BOD - Raw Sewage	200 mg/l	SS - Raw Sewage	180 mg/l
- Removal	90%	- Removal	90%

PRIMARY TREATMENT

Screening

1" bar screens

Grit Removal

Type: Grit channels

Retention: 0.8 min

Primary Sedimentation

Type: Walker Process

Size: Two 49.3' x 18' x 12.25'
(135,700 gal)

Retention: 1.3 hr

Loading: Surface, 1400 gal/ft²/day
Weir, 17,100 gal/ft/day

SECONDARY TREATMENT

Aeration Tanks

Type: Diffused air; triple-pass

Size: Two tanks, each with
2 passes 118' x 18' x 10.7'
1 pass 85.5' x 18' x 10.7'
(833,000 gal. total)

Retention: 8.0 hours

Air Supply

One Sutorbilt - 1500 cfm

Two Roots-Connerville - 750 cfm

Diffusers - (each tank)

1) 132 Schumacher Brandel tubes in
first two passes

2) 41 Spargers on 2' centres in third
pass

Secondary Sedimentation

Type: Rex Unitube Tow-Bro

Size: Two 50' dia x 10.6' swd
(260,000 gal)

Retention: 2.5 hr

Loading: Surface, 1000 gal/ft²/day
Weir, 8500 gal/ft/day

CHLORINATION

Type: Kent

Chlorine Contact Chamber

- in outfall

OUTFALL

- to Lake Ontario

SLUDGE HANDLING

Digestion System

Type: Two-stage

Primary --

Size: Two 40' dia tanks (313,000 gal
total)

Loading: 2.7 lb/ft³/mo

Secondary --

Size: One 40' dia tank (143,000 gal)

Loading Total: 1.9 lb/ft³/mo

'70 REVIEW

GENERAL

Plant flows were not recorded in 1970 as the metering equipment had broken down and was beyond repair due to obsolescence. The replacement metering was not delivered and installed until late in the year. It is anticipated that the flows to the plant were within 10% to 15% of the flows recorded in the previous years. This is based on the facts that the raw sewage strength and the final effluent quality were similar to 1969 values.

EXPENDITURES

The 1970 operating expenditures were \$38,417.86, a decrease of about 9% from the 1969 costs.

PLANT EFFICIENCY

The average raw sewage strength of 219 mg/l BOD compared with the raw sewage strengths of 215 mg/l BOD in 1969. The average removal efficiency of 92% for BOD and suspended solids was similar to the removal efficiency in the previous year. The effluent quality at 17 mg/l BOD and 29 mg/l suspended solids did not meet the Ontario Water Resources Commissions objective of 15 mg/l for BOD and suspended solids.

AERATION

Organic loadings to the aeration section could not be determined as flows were not measured during the year. Comparing the overall plant efficiency in 1970 with the efficiency of the previous year, it is estimated that the loading was about 0.15 pounds of BOD per day per pound of MLSS. The average MLSS concentration of 2,490 mg/l was approximately 14% greater than in 1969.

SLUDGE DIGESTION and DISPOSAL

A total volume of 1.65 million gallons of raw sludge was pumped to the digester representing a volume decrease of 15% from 1969. The average raw sludge total solids concentration was 5.9%. The total volume of liquid digested sludge hauled from the plant was 3,999 cubic yards and was approximately 18% less than the quantity hauled the previous year.

CONCLUSIONS

In general the plant operated satisfactorily during the year, however an improved effluent could be expected.

Plant flows were not recorded due to the obsolescence of the existing metering equipment and the long delivery period for replacement metering.

PROJECT COSTS

NET CAPITAL COST (Final)	\$676, 033. 78
DEDUCT - Portion financed by CMHC/MDLB (Final)	<u>41, 721. 91</u>
Long Term Debt to OWRC	<u>\$634, 311. 87</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1970	<u>\$292, 131. 06</u>
Net Operating	\$ 37, 710. 55
Debt Retirement	23, 013. 00
Reserve	2, 704. 87
Interest Charged	<u>35, 538. 09</u>
TOTAL	\$ <u>98, 966. 51</u>

RESERVE ACCOUNT

Balance @ January 1, 1970	\$ 41, 061. 30
Deposited by Municipality	2, 704. 87
Interest Earned	<u>2, 674. 93</u>
	\$ 46, 441. 10
Less Expenditures	<u>5, 438. 40</u>
Balance @ December 31, 1970	\$ <u>41, 002. 70</u>

1970 OPERATING COSTS

• PAYROLL	56 %
• FUEL	< 1 %
• POWER	20 %
• CHEMICALS	4 %
• GENERAL SUPPLIES	2 %
• EQUIPMENT	1 %
• REPAIRS & MAINTENANCE	3 %
• SUNDRY	13 %
• WATER	< 1 %
• TRAVEL	< 1 %

TOTAL ANNUAL COST

NET OPERATING	38 %
DEBT RETIREMENT	23 %
INTEREST	36 %
RESERVE FUND	3 %

Yearly Operating Costs

YEAR	MILLION GALLONS TREATED	TOTAL OPERATING COSTS	COST PER MILLION GAL	COST PER LB OF BOD REMOVED
1966	578.42	\$38,565.75	\$66.67	3 cents
1967	596.29	41,183.66	69.07	3 cents
1968	568.20	42,055.65	74.02	3 cents
1969	594.90*	42,152.71	70.86	4 cents
1970	-	38,417.86	-	-

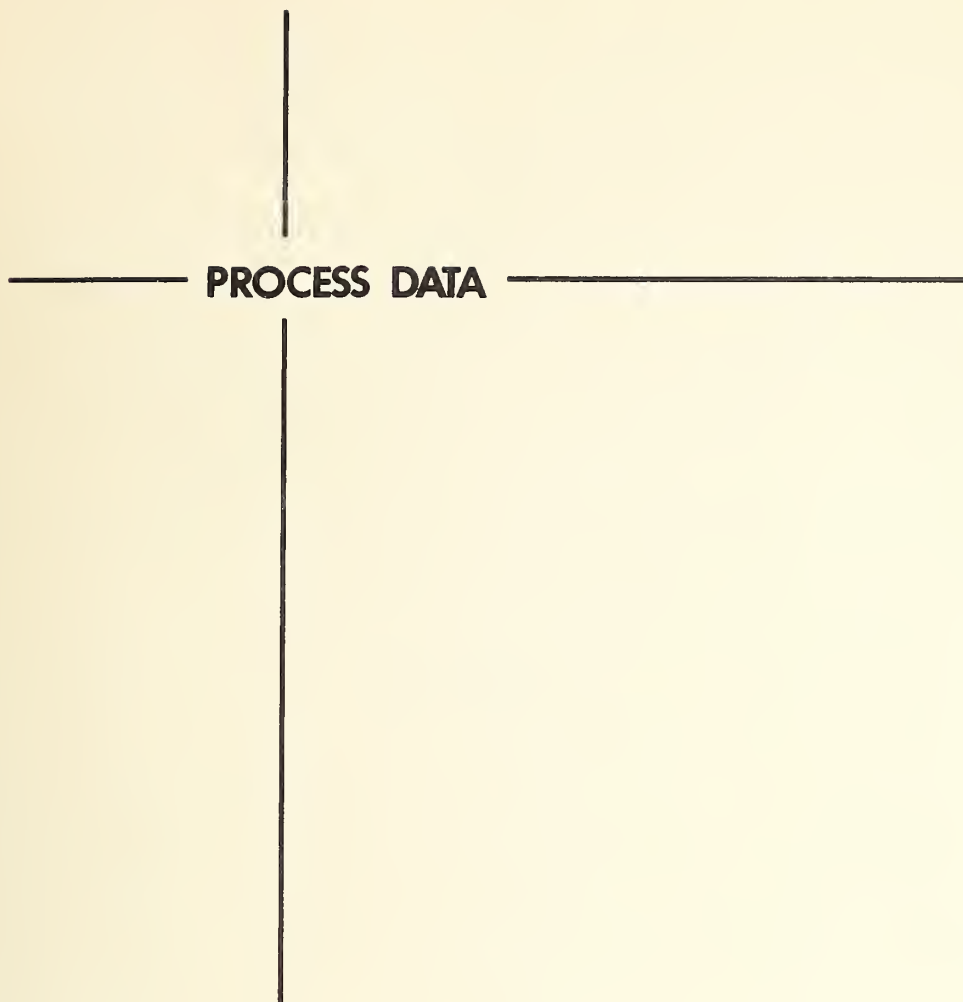
MONTHLY OPERATING COSTS

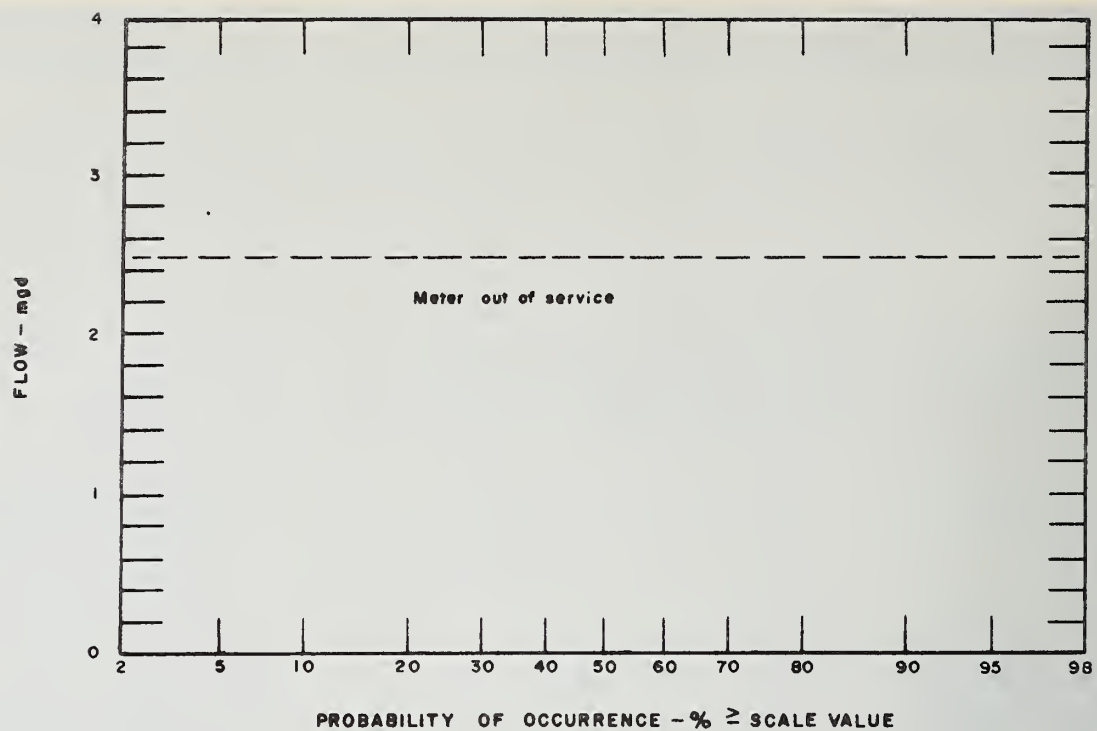
MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	* SUNDRY	WATER	TRAVEL
JAN	2904.64	2826.65	-	77.99	-	-	-	-	-	-	-	-
FEB	2926.35	1996.79	-	-	720.72	-	29.78	-	94.14	58.12	7.90	18.90
MAR	2392.41	1237.91	-	71.55	619.33	-	63.76	57.88	55.52	279.16	7.30	-
APR	2299.98	1092.73	-	-	671.46	-	59.03	113.07	-	356.99	6.70	-
MAY	5016.57	3479.16	-	74.74	763.23	-	78.36	-	270.72	342.16	8.20	-
JUNE	2146.36	1191.71	-	-	662.65	-	2.67	-	-	278.46	10.87	-
JULY	3757.74	1950.38	-	-	701.21	871.77	10.76	-	11.51	197.56	14.55	-
AUG	3545.99	1822.43	-	-	738.11	145.30	94.04	-	89.25	633.66	7.60	15.60
SEPT	3518.40	1128.81	-	-	689.52	145.30	93.68	-	-	1449.73	11.36	-
OCT	3719.51	1557.70	-	77.17	573.92	290.60	23.08	296.26	351.34	536.36	13.08	-
NOV	2069.61	1411.71	-	-	525.92	-	57.73	-	-	50.21	15.04	9.00
DEC	4120.30	2015.35	-	72.68	926.92	-	183.57	-	127.88	735.12	43.03	15.75
TOTAL	38417.86	21711.33	-	374.13	7592.99	1452.97	696.46	467.21	1000.36	4917.53	145.63	59.25

BRACKETS INDICATE CREDIT

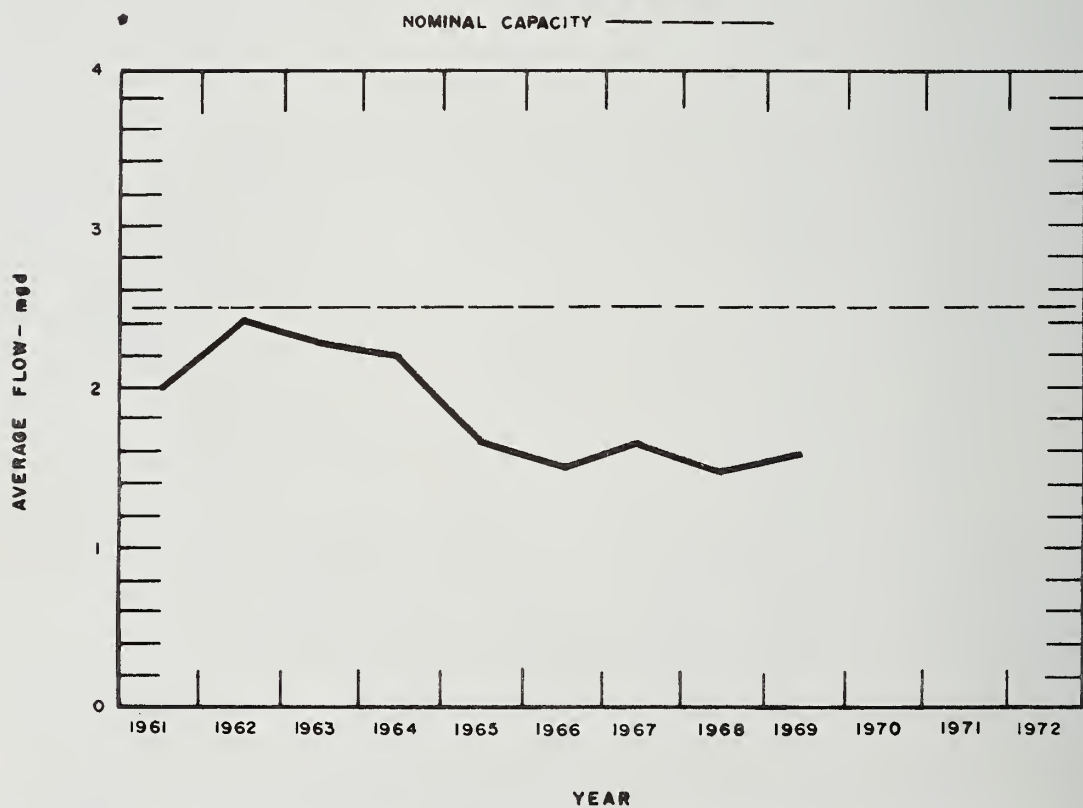
* SUNDRY INCLUDES SLUDGE HAULAGE COSTS WHICH WERE \$3868.97

Note: Total does not include year-end adjustments.



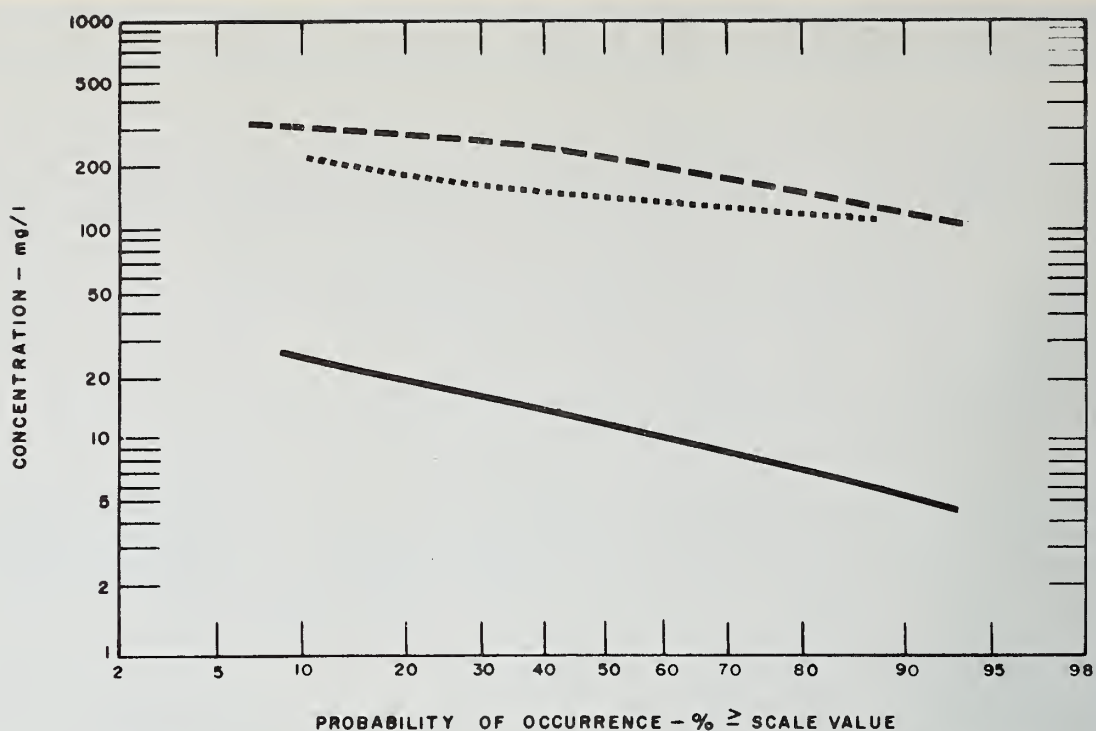


FLAWS

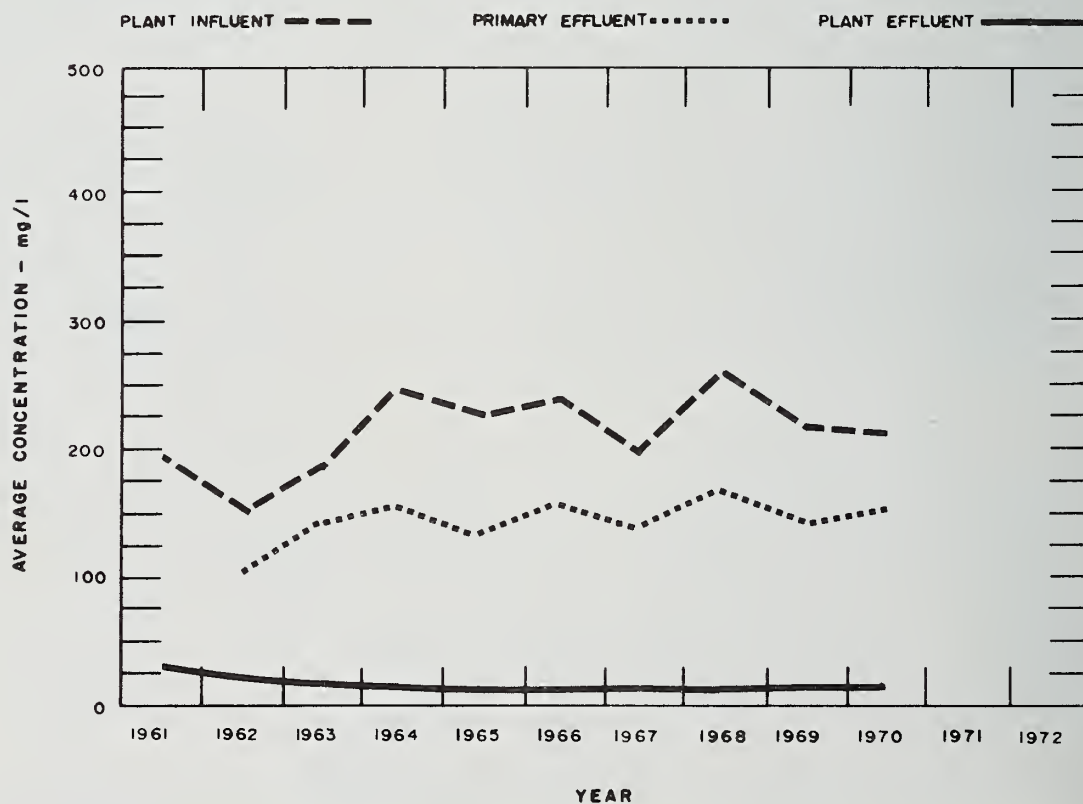


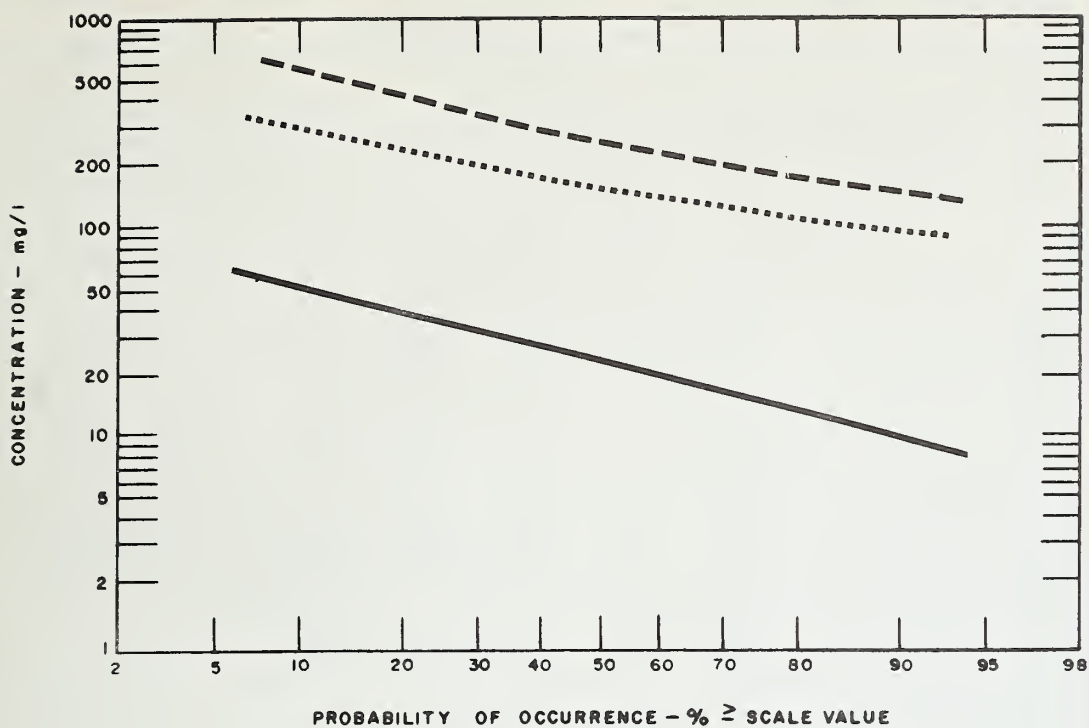
PLANT FLOWS and CHLORINATION

MONTH	TOTAL FLOW mil gal	AVERAGE DAILY FLOW mil gal	MAXIMUM DAILY FLOW mil gal	MINIMUM DAILY FLOW mil gal	CHLORINE USED 10 ³ pounds	DOSAGE mg/l
JAN	Meter	out	of	service	0	
FEB	"	"	"	"	0	
MAR	"	"	"	"	0	
APR	"	"	"	"	0	
MAY	"	"	"	"	.8	
JUNE	"	"	"	"	1.6	
JULY	"	"	"	"	1.7	
AUG	"	"	"	"	1.5	
SEPT	"	"	"	"	1.1	
OCT	"	"	"	"	.6	
NOV	"	"	"	"	0	
DEC	"	"	"	"	0	
TOTAL	"	"	"	"	7.3	
AVERAGE	"	"	"	"	1.2	

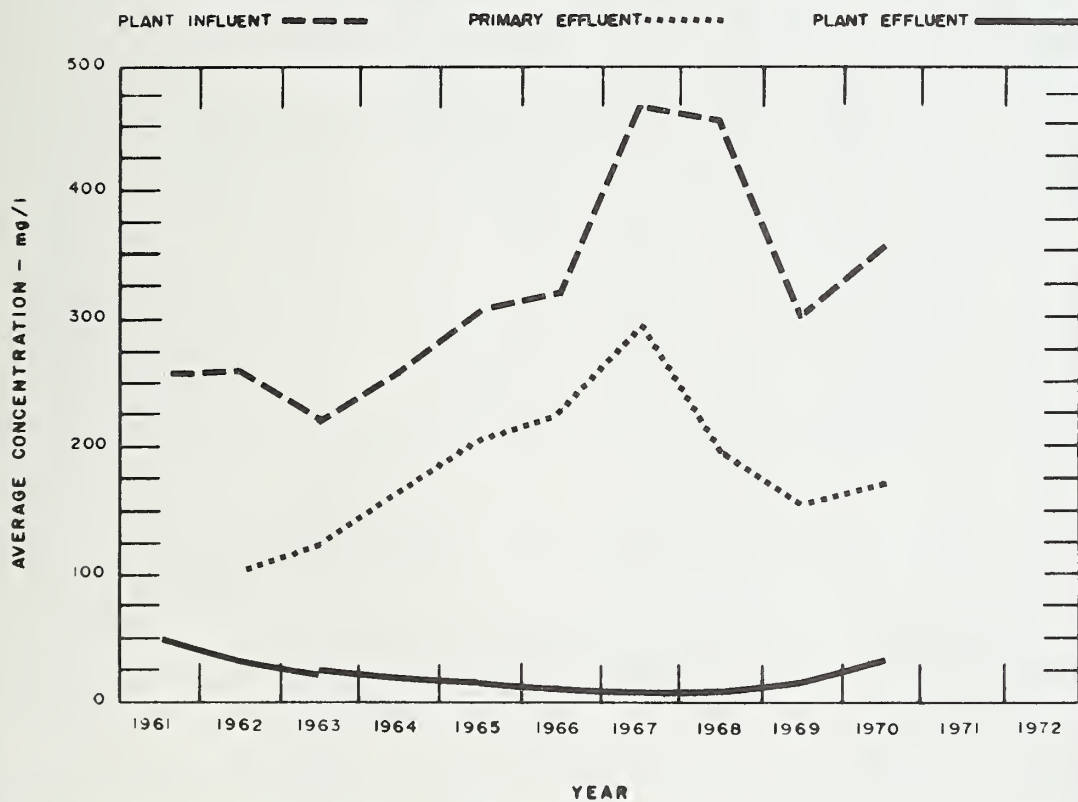


BIOCHEMICAL OXYGEN DEMAND





SUSPENDED SOLIDS



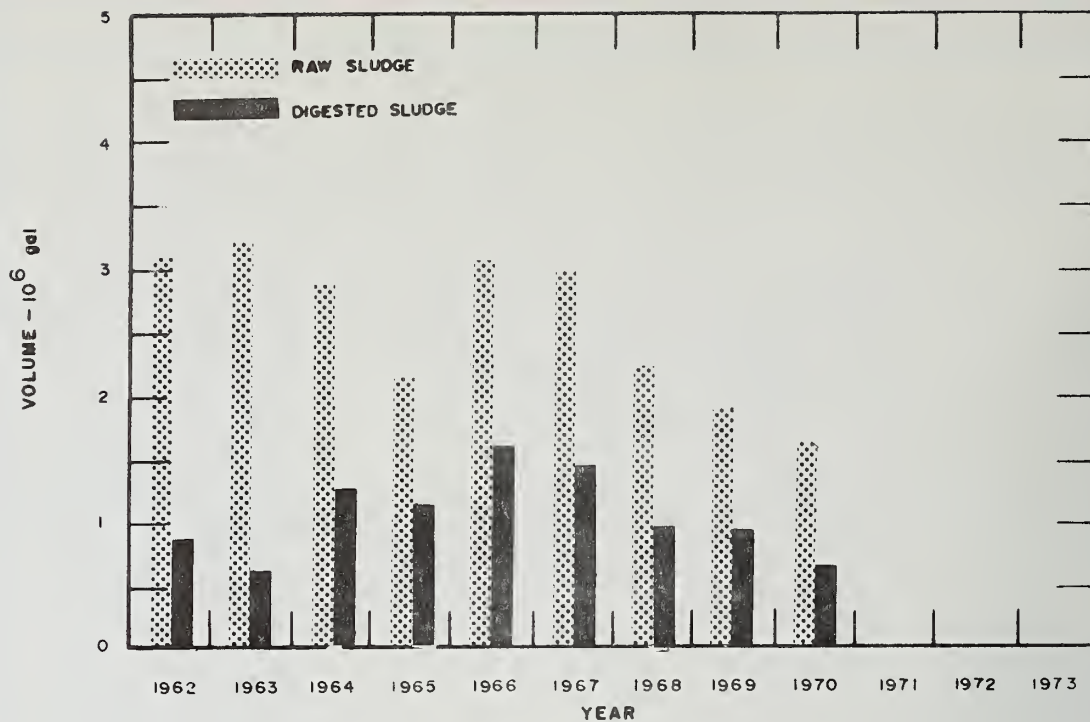
PLANT EFFICIENCY

MONTH	BIOCHEMICAL OXYGEN DEMAND						SUSPENDED SOLIDS						GRIT REMOVED cu ft
	INFLUENT		EFFLUENT		REDUCTION		INFLUENT		EFFLUENT		REDUCTION		
	n	mg/l	n	mg/l	%	pounds	n	mg/l	n	mg/l	%	pounds	
JAN	2	240	2	45	81	-	5	249	4	22	91	-	40
FEB	3	150	2	15	90	-	7	331	5	20	94	-	19
MAR	2	127	2	14	89	-	7	357	7	36	90	-	33
APR	2	150	2	10	93	-	6	207	4	24	88	-	47
MAY	2	240	2	9	96	-	5	404	5	27	93	-	21
JUNE	3	273	3	16	94	-	6	252	6	15	94	-	31
JULY	2	170	2	16	91	-	6	313	5	15	95	-	33
AUG	2	340	2	9	97	-	5	853	5	15	98	-	54
SEPT	2	270	2	7	97	-	5	224	5	33	85	-	45
OCT	2	280	2	30	89	-	5	450	5	94	79	-	24
NOV	2	175	2	8	95	-	6	257	5	34	87	-	31
DEC	3	223	3	20	91	-	6	462	5	15	97	-	12
TOTAL	27	-	26	-	-	-	69	-	61	-	-	-	390
AVERAGE	-	219	-	17	92	-	-	357	-	29	92	-	33

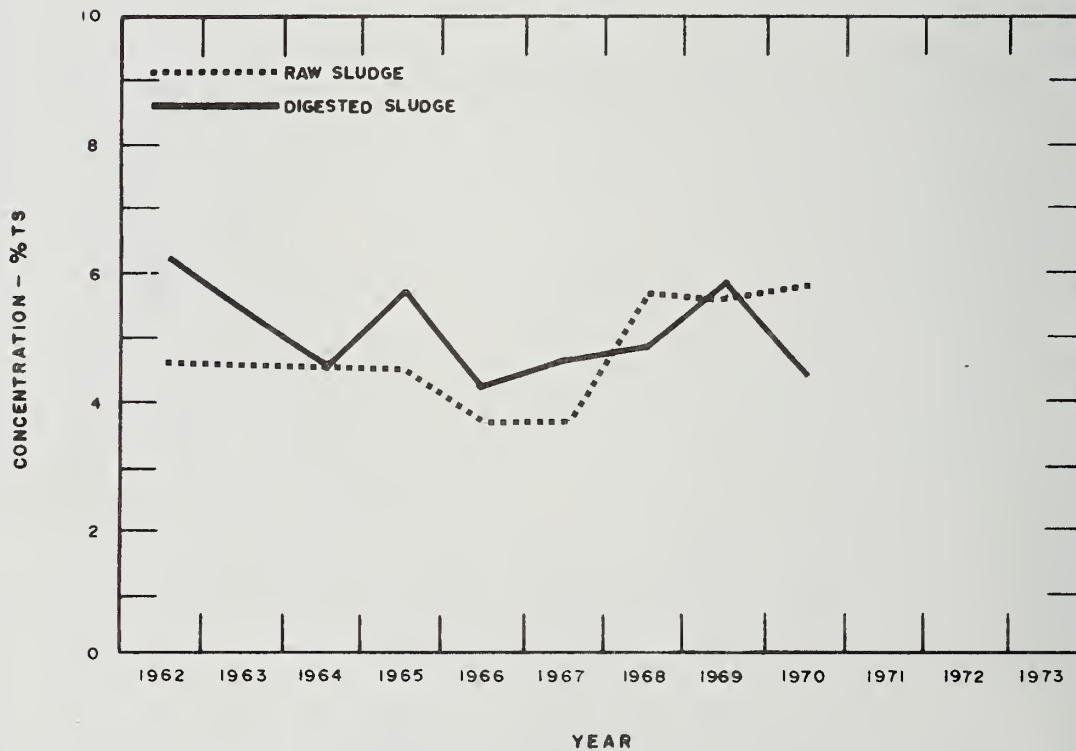
NOTE - n is the number of samples taken

AERATION

MONTH	AERATION INF.		SECONDY. EFF.		MLSS CONCN mg /l
	BOD	SS CONCN	BOD	SS CONCN	
	mg/l	mg/l	mg/l	mg/l	
Jan.	165	208	45	22	2720
Feb.	100	162	15	20	2230
Mar.	155	204	14	36	2390
Apr.	115	117	10	24	2460
May	135	162	9	27	2560
June	180	165	16	15	2520
July	120	250	16	15	2530
Aug.	145	189	9	15	2870
Sept.	170	138	7	33	2360
Oct.	185	190	30	94	2240
Nov.	150	185	8	34	2570
Dec.	176	95	20	15	2470
Total	-	-	-	-	-
Average	152	175	17	29	2490



DIGESTION



SLUDGE DIGESTION and DISPOSAL

MONTH	RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT		SLUDGE DISPOSAL	
	VOLUME 10 ³ gal	TOTAL SOLIDS %	VOL SOLIDS %	VOLUME 10 ³ gal	TOTAL SOLIDS %	VOL SOLIDS %	VOLUME 10 ³ gal	TOTAL SOLIDS %	DEWATERED cu yd	LIQUID cu yd
JAN	156.7	6.4	55	48.4	5.4	42	-	-	-	288
FEB	158.2	5.4	62	64.8	6.0	48	-	-	-	384
MAR	155.5	7.3	69	61.0	6.0	49	-	-	-	360
APR	153.9	7.5	67	41.0	4.9	45	-	.7	-	243
MAY	120.0	4.7	59	34.4	4.3	44	-	.3	-	204
JUNE	167.6	4.6	59	80.9	7.0	45	-	2.1	-	480
JULY	143.8	6.2	68	69.8	5.7	49	-	.6	-	414
AUG	146.2	7.6	71	103.2	5.5	43	-	.3	-	612
SEPT	117.6	6.6	76	84.9	3.1	39	-	.3	-	504
OCT	127.5	4.2	-	50.5	1.1	-	-	.2	-	300
NOV	123.5	3.4	-	22.2	1.7	-	-	.2	-	132
DEC	83.0	6.4	81	13.0	2.6	-	-	.1	-	78
TOTAL	1653.5	-	-	674.1	-	-	-	-	-	3999
AVERAGE	137.8	5.9	67	56.2	4.4	45	-	.5	-	333

Date Due

JUL 20 1971

ONTARIO WATER RESOURCES COMMISSION
DIVISION OF PLANT OPERATIONS.

BURLINGTON (DRURY LANE)

OPERATING SUMMARY - 1970

TD227/B87/D78/W38/1970/MOE

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A.J. HARRIS

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